



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/510,053	02/22/2000	Mark Nixon	06005/35628A	7646

7590

04/10/2003

Marshall O'Toole Gerstein Murray & Borun
6300 Sears Tower
233 South Wacker Drive
Chicago, IL 60606-6402

EXAMINER

THANGAVELU, KANDASAMY

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 04/10/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/510,053

Applicant(s)

NIXON ET AL.

Examiner

Kandasamy Thangavelu

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 & 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-21 of the application have been examined.

Information Disclosure Statement

2. Acknowledgment is made of the information disclosure statements filed on September 25, 2000 and October 6, 2000 together with copies of the patents and papers. The patents and papers have been considered in reviewing the claims.

Drawings

3. The drawings submitted on February 22, 2000 are accepted.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains..

Art Unit: 2123

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-9 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Santoline et al. (SA)** (PCT WO 97/38362) in view of **Bowling (BO)** (PCT WO 97/45778).

6.1 SA teaches a stimulated simulator for a distributed process control system. Specifically, as per claim 1, SA teaches an apparatus adapted to be used with a distributed process control system having a user workstation remotely located from a distributed controller that controls one or more field devices using control modules (Fig. 1; Page 1, Lines 2-3; Page 1, Lines 9-13 and Page 6, Lines 10-12); the apparatus comprising:

a computer having a memory and a processing unit (Page 6, Lines 10-12); and

the controller application is further adapted to be executed on the distributed controller to implement one of the control modules during operation of the distributed process control system (Page 1, Lines 9-13).

SA does not expressly teach a configuration application stored in the memory of the computer and adapted to be executed on the processing unit of the computer. BO teaches a configuration application stored in the memory of the computer and adapted to be executed on

Art Unit: 2123

the processing unit of the computer (Page 2, Para 2), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and design, test and verification of various control system strategies in a comprehensive manner (Page 4, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included a configuration application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, as that would facilitate the design and test of a part or the overall control of the industrial plant and design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach that the configuration application is capable of being executed on the user workstation to create control modules for execution by the distributed controller. **BO** teaches that the configuration application is capable of being executed on the user workstation to create control modules for execution by the distributed controller (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the configuration application capable of being executed on the user workstation to create control modules for execution by the distributed controller, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer. **BO** teaches a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer (Page 2, Para 3), as that facilitates the design and test of a part or

Art Unit: 2123

the overall control of the industrial plant (Page 2, Para 2) and design, test and verification of various control system strategies in a comprehensive manner (Page 4, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, as that would facilitate the design and test of a part or the overall control of the industrial plant and design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach that the configuration application, when executed on the computer, is further adapted to create a first control module capable of being used by the distributed controller within the distributed process control system. **BO** teaches that the configuration application, when executed on the computer, is further adapted to create a first control module capable of being used by the distributed controller within the distributed process control system (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the configuration application that when executed on the computer, is further adapted to create a first control module capable of being used by the distributed controller within the distributed process control system, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach that the controller application is adapted to cause execution of the first control module within the computer to simulate operation of the distributed process control system. **BO** teaches that the controller application is adapted to cause execution of the

Art Unit: 2123

first control module within the computer to simulate operation of the distributed process control system (Page 2, Para 3; Page 4, Para 2), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and allows the actual device control software to operate at a rate slower or faster than real time and provides the capability to arbitrarily stop and start the controller software's operation (Page 4, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the controller application adapted to cause execution of the first control module within the computer to simulate operation of the distributed process control system, as that would facilitate the design and test of a part or the overall control of the industrial plant and would allow the actual device control software to operate at a rate slower or faster than real time and provide the capability to arbitrarily stop and start the controller software's operation.

6.2 As per Claim 2, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach that the configuration application is adapted to create a user interface for use in displaying information to a user, and further includes a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to use the user interface to display information pertaining to the first control module to a user. **BO** teaches that the configuration application is adapted to create a user interface for use in displaying information to a user, and further includes a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to use the user interface to

Art Unit: 2123

display information pertaining to the first control module to a user (Page 7, Para 5; Page 1, Para 2), as that provides an operator interface through which the plant conditions and the device controller can be monitored and controlled (Page 1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the configuration application adapted to create a user interface for use in displaying information to a user, and further included a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application was adapted to use the user interface to display information pertaining to the first control module to a user, as that would provide an operator interface through which the plant conditions and the device controller can be monitored and controlled.

6.3 As per Claim 3, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach that the apparatus further includes a configuration database application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the configuration database application is adapted to communicate with the controller application within the computer to manage a configuration database. **BO** teaches that the apparatus further includes a configuration database application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the configuration database application is adapted to communicate with the controller application within the computer to manage a configuration database (Page 3, Para 2; Page 6, Para 3 to Page 7, Para 1), as that would allow the simulation unit to read/write configuration data readable by the control software to

Art Unit: 2123

implement various control processes (Page 6, Para 3 to Page 7, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the apparatus further including a configuration database application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the configuration database application was adapted to communicate with the controller application within the computer to manage a configuration database, as that would allow the simulation unit to read/write configuration data readable by the control software to implement various control processes.

6.4 As per Claim 4, **SA** and **BO** teach the apparatus of claim 1. **SA** teaches that the controller application includes an execution rate parameter specifying the rate of execution of the first control module within the computer (Page 2, Lines 3-8; Page 8, Lines 23-25 and Page 9, Lines 16-17).

6.5 As per Claim 5, **SA** and **BO** teach the apparatus of claim 4. **SA** does not expressly teach that the execution rate parameter can be set to be greater than or less than a real time execution rate of the first control module when the first control module is executed within the distributed controller of the distributed process control system. **BO** teaches that the execution rate parameter can be set to be greater than or less than a real time execution rate of the first control module when the first control module is executed within the distributed controller of the distributed process control system (Page 2, Para 2), as that would allow the design, test and verification of control system strategies in a more comprehensive manner (Page 4, Para 3). It

Art Unit: 2123

would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the execution rate parameter to be set to be greater than or less than a real time execution rate of the first control module when the first control module was executed within the distributed controller of the distributed process control system, as that would allow the design, test and verification of control system strategies in a more comprehensive manner.

6.6 As per Claim 6, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach that the configuration application is adapted to create a control module capable of being executed within the distributed controller during operation of the distributed process control system. **BO** teaches that the configuration application is adapted to create a control module capable of being executed within the distributed controller during operation of the distributed process control system (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the configuration application adapted to create a control module capable of being executed within the distributed controller during operation of the distributed process control system, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

6.7 As per Claim 7, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach that the configuration application is adapted to create a control module capable of being executed

Art Unit: 2123

within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system. **BO** teaches the configuration application is adapted to create a control module capable of being executed within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included the configuration application adapted to create a control module capable of being executed within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

6.8 As per Claim 8, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach a simulation application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the simulation application is adapted to communicate with the controller application within the computer to simulate the operation of the distributed process control system. **BO** teaches a simulation application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the simulation application is adapted to communicate with the controller application within the computer to simulate the operation of the distributed process control system (Page 2, Para 3; Page 4, Para 2), as that facilitates the design and test of a part or the overall control of the

Art Unit: 2123

industrial plant (Page 2, Para 2) and allows the actual device control software to operate at a rate slower or faster than real time and provides the capability to arbitrarily stop and start the controller software's operation (Page 4, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included a simulation application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the simulation application is adapted to communicate with the controller application within the computer to simulate the operation of the distributed process control system, as that would facilitate the design and test of a part or the overall control of the industrial plant and would allow the actual device control software to operate at a rate slower or faster than real time and provide the capability to arbitrarily stop and start the controller software's operation.

6.9 As per Claim 9, **SA** and **BO** teach the apparatus of claim 1. **SA** teaches that the controller application is adapted to communicate with the field devices through an input/output device when the controller application is executed within the distributed controller (Page 1, Lines 9-13; Page 3, Lines 27-33).

6.10 As per Claim 11, **SA** and **BO** teach the apparatus of claim 1. **SA** does not expressly teach a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use a user interface to display information sent from the further controller. **BO** teaches a viewing application stored in the memory of the computer and adapted

Art Unit: 2123

to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use a user interface to display information sent from the further controller (Page 7, Para 5; Page 1, Para 2), as that provides an operator interface through which the plant conditions and the device controller can be monitored and controlled (Page 1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use a user interface to display information sent from the further controller, as that would provide an operator interface through which the plant conditions and the device controller can be monitored and controlled.

6.11 As per claim 12, **SA** teaches a method of simulating a distributed process control system having a user workstation remotely located from a distributed controller which controls one or more field devices using control modules (Fig. 1; Page 1, Lines 2-3; Page 1, Lines 9-13 and Page 6, Lines 10-12); and

the distributed controller is adapted to store and execute a controller application to control a process using the control modules during operation of the distributed process control system (Page 1, Lines 9-13).

SA does not expressly teach that the user workstation is adapted to store and execute a configuration application used to create the control modules for execution by the distributed controller. **BO** teaches that the user workstation is adapted to store and execute a configuration

Art Unit: 2123

application used to create the control modules for execution by the distributed controller (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the user workstation adapted to store and execute a configuration application used to create the control modules for execution by the distributed controller, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach the method comprising the step of storing the configuration application in a first computer having a memory and a processing unit. **BO** teaches the method comprising the step of storing the configuration application in a first computer having a memory and a processing unit (Page 2, Para 2), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and design, test and verification of various control system strategies in a comprehensive manner (Page 4, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the method comprising the step of storing the configuration application in a first computer having a memory and a processing unit, as that would facilitate the design and test of a part or the overall control of the industrial plant and design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach storing the controller application in the memory of the first computer. **BO** teaches storing the controller application in the memory of the first computer (Page 2, Para 3), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and design, test and verification of various control system

Art Unit: 2123

strategies in a comprehensive manner (Page 4, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included storing the controller application in the memory of the first computer, as that would facilitate the design and test of a part or the overall control of the industrial plant and design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach executing the configuration application on the first computer to create a first control module adapted to be used by the distributed controller within the distributed process control system. **BO** teaches executing the configuration application on the first computer to create a first control module adapted to be used by the distributed controller within the distributed process control system (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included executing the configuration application on the first computer to create a first control module adapted to be used by the distributed controller within the distributed process control system, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

SA does not expressly teach executing the controller application on the first computer to cause execution of the first control module within the first computer to thereby simulate operation of the distributed process control system. **BO** teaches executing the controller application on the first computer to cause execution of the first control module within the first computer to thereby simulate operation of the distributed process control system (Page 2, Para 3;

Art Unit: 2123

Page 4, Para 2), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and allows the actual device control software to operate at a rate slower or faster than real time and provides the capability to arbitrarily stop and start the controller software's operation (Page 4, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included executing the controller application on the first computer to cause execution of the first control module within the first computer to thereby simulate operation of the distributed process control system, as that would facilitate the design and test of a part or the overall control of the industrial plant and would allow the actual device control software to operate at a rate slower or faster than real time and provide the capability to arbitrarily stop and start the controller software's operation.

6.12 As per Claim 13, **SA** and **BO** teach the method of claim 12. **SA** does not expressly teach the steps of executing the configuration application to create a user interface for use in displaying information to a user, storing a viewing application in the memory of the first computer and executing the viewing application on the first computer to display information pertaining to the first control module to a user on a display associated with the first computer using the user interface. **BO** teaches the steps of executing the configuration application to create a user interface for use in displaying information to a user, storing a viewing application in the memory of the first computer and executing the viewing application on the first computer to display information pertaining to the first control module to a user on a display associated with the first computer using the user interface (Page 7, Para 5; Page 1, Para 2), as that provides an operator

Art Unit: 2123

interface through which the plant conditions and the device controller can be monitored and controlled (Page 1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the steps of executing the configuration application to create a user interface for use in displaying information to a user, storing a viewing application in the memory of the first computer and executing the viewing application on the first computer to display information pertaining to the first control module to a user on a display associated with the first computer using the user interface, as that would provide an operator interface through which the plant conditions and the device controller can be monitored and controlled.

6.13 As per Claim 14, **SA** and **BO** teach the method of claim 12. **SA** does not expressly teach the steps of storing a configuration database application in the memory of the first computer and executing the configuration database application on the first computer so that the configuration database application communicates with the controller application within the first computer to manage a configuration database. **BO** teaches the steps of storing a configuration database application in the memory of the first computer and executing the configuration database application on the first computer so that the configuration database application communicates with the controller application within the first computer to manage a configuration database (Page 3, Para 2; Page 6, Para 3 to Page 7, Para 1), as that would allow the simulation unit to read/write configuration data readable by the control software to implement various control processes (Page 6, Para 3 to Page 7, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of

Art Unit: 2123

BO that included the steps of storing a configuration database application in the memory of the first computer and executing the configuration database application on the first computer so that the configuration database application communicates with the controller application within the first computer to manage a configuration database, as that would allow the simulation unit to read/write configuration data readable by the control software to implement various control processes.

6.14 As per Claim 15, **SA** and **BO** teach the method of claim 12. **SA** teaches that the step of executing the controller application includes the step of specifying an execution rate for the first control module when executing the first control module within the first computer (Page 2, Lines 3-8; Page 8, Lines 23-25 and Page 9, Lines 16-17).

6.15 As per Claim 16, **SA** and **BO** teach the method of claim 15. **SA** does not expressly teach that the step of executing the controller application includes the step of executing the first control module at an execution rate that is greater than or less than a real time execution rate of the first control module when the first control module is executed within the distributed controller of the distributed process control system. **BO** teaches that the step of executing the controller application includes the step of executing the first control module at an execution rate that is greater than or less than a real time execution rate of the first control module when the first control module is executed within the distributed controller of the distributed process control system (Page 2, Para 2), as that would allow the design, test and verification of control system strategies in a more comprehensive manner (Page 4, Para 3). It would have been obvious to one

Art Unit: 2123

of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the step of executing the controller application including the step of executing the first control module at an execution rate that is greater than or less than a real time execution rate of the first control module when the first control module is executed within the distributed controller of the distributed process control system, as that would allow the design, test and verification of control system strategies in a more comprehensive manner.

6.17 As per Claim 17, **SA** and **BO** teach the method of claim 12. **SA** does not expressly teach that the step of executing the configuration application includes the step of creating a control module capable of being executed within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system. **BO** teaches that the step of executing the configuration application includes the step of creating a control module capable of being executed within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system (Abstract), as that facilitates the design, test and verification of various control system strategies in a comprehensive manner (Abstract). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the step of executing the configuration application including the step of creating a control module capable of being executed within one of the field devices communicatively connected to the distributed controller during the operation of the distributed process control system, as that would facilitate the design, test and verification of various control system strategies in a comprehensive manner.

Art Unit: 2123

6.18 As per Claim 18, **SA** and **BO** teach the method of claim 12. **SA** does not expressly teach the steps of storing a simulation application in the memory of the first computer and executing the simulation application on the first computer to communicate with the controller application within the first computer to simulate the operation of the distributed process control system. **BO** teaches the steps of storing a simulation application in the memory of the first computer and executing the simulation application on the first computer to communicate with the controller application within the first computer to simulate the operation of the distributed process control system (Page 2, Para 3; Page 4, Para 2), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and allows the actual device control software to operate at a rate slower or faster than real time and provides the capability to arbitrarily stop and start the controller software's operation (Page 4, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **SA** with the method of **BO** that included the steps of storing a simulation application in the memory of the first computer and executing the simulation application on the first computer to communicate with the controller application within the first computer to simulate the operation of the distributed process control system, as that would facilitate the design and test of a part or the overall control of the industrial plant and would allow the actual device control software to operate at a rate slower or faster than real time and provide the capability to arbitrarily stop and start the controller software's operation.

Art Unit: 2123

7. Claims 10 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Santoline et al. (SA)** (PCT WO 97/38362) in view of **Bowling (BO)** (PCT WO 97/45778), and further in view of **Brown et al. (BR)** (U.S. Patent 6, 377,859).

7.1 As per Claim 10, **SA** and **BO** teach the apparatus of claim 1. **SA** and **BO** do not expressly teach that the controller application is capable of communicating with a further controller that is of a different type than the distributed controller of the distributed process control system. **BR** teaches that the controller application is capable of communicating with a further controller that is of a different type than the distributed controller of the distributed process control system (Col 2, Lines 14-25), as that allows devices made by different manufacturers to interoperate and the process control industry to decentralize process control and simplify the distributed control systems (Col 2, Lines 1- 14; Lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** and **BO** with the apparatus of **BR** that included the controller application capable of communicating with a further controller that was of a different type than the distributed controller of the distributed process control system, as that would allow devices made by different manufacturers to interoperate and the process control industry to decentralize process control and simplify the distributed control systems.

7.2 As per claim 19, **SA** teaches an apparatus adapted to be used in conjunction with a distributed process control system having a user workstation remotely located from a distributed

Art Unit: 2123

controller that controls one or more field devices using control modules (Fig. 1; Page 1, Lines 2-3; Page 1, Lines 9-13 and Page 6, Lines 10-12); the apparatus comprising:

a computer having a memory and a processing unit and a display connected to the computer (Fig. 1, Item 21; Page 6, Lines 10-12); and

the controller application is adapted to be executed on the distributed controller to implement a control module during operation of the distributed process control system (Page 1, Lines 9-13).

SA does not expressly teach a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer. **BO** teaches a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer (Page 2, Para 3), as that facilitates the design and test of a part or the overall control of the industrial plant (Page 2, Para 2) and design, test and verification of various control system strategies in a comprehensive manner (Page 4, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included a controller application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, as that would facilitate the design and test of a part or the overall control of the industrial plant and design, test and verification of various control system strategies in a comprehensive manner.

SA and **BO** do not expressly teach that the controller application is capable of communicating with a further controller that is of a different type than the distributed controller of the distributed process control system. **BR** teaches that the controller application is capable of communicating with a further controller that is of a different type than the distributed controller

Art Unit: 2123

of the distributed process control system (Col 2, Lines 14-25), as that allows devices made by different manufacturers to interoperate and the process control industry to decentralize process control and simplify the distributed control systems (Col 2, Lines 1- 14; Lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** and **BO** with the apparatus of **BR** that included the controller application capable of communicating with a further controller that was of a different type than the distributed controller of the distributed process control system, as that would allow devices made by different manufacturers to interoperate and the process control industry to decentralize process control and simplify the distributed control systems.

SA does not expressly teach a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use the display to display information sent from the further controller. **BO** teaches a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use the display to display information sent from the further controller (Page 7, Para 5; Page 1, Para 2), as that provides an operator interface through which the plant conditions and the device controller can be monitored and controlled (Page 1, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** with the apparatus of **BO** that included teaches a viewing application stored in the memory of the computer and adapted to be executed on the processing unit of the computer, wherein the viewing application is adapted to communicate with the controller application and to use the

Art Unit: 2123

display to display information sent from the further controller, as that would provide an operator interface through which the plant conditions and the device controller can be monitored and controlled.

7.3 As per Claim 20, **SA**, **BO** and **BR** teach the apparatus of claim 19. **SA** and **BO** do not expressly teach the apparatus further including an interface connected between the further controller and the controller application. **BR** teaches the apparatus further including an interface connected between the further controller and the controller application (Col 2, Lines 14-25), as that allows devices made by different manufacturers to communicate with one another and interoperate to effect decentralized control within a process (Col 2, Lines 1- 14; Lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the apparatus of **SA** and **BO** with the apparatus of **BR** that included the apparatus further including an interface connected between the further controller and the controller application, as that would allow devices made by different manufacturers to communicate with one another and interoperate to effect decentralized control within a process.

7.4 As per Claim 10, **SA**, **BO** and **BR** teach the apparatus of claim 20. **SA** and **BO** do not expressly teach the apparatus wherein the interface is an OPC interface. **BR** teaches the apparatus wherein the interface is an OPC interface (Col 2, Lines 14-25), as that allows devices made by different manufacturers to communicate with one another and interoperate to effect decentralized control within a process (Col 2, Lines 1- 14; Lines 14-25). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the

Art Unit: 2123

apparatus of **SA** and **BO** with the apparatus of **BR** that included the apparatus wherein the interface is an OPC interface, as that would allow devices made by different manufacturers to communicate with one another and interoperate to effect decentralized control within a process.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to Distributed process control simulation and Open communication interface.

1. Irwin et al., "Indirect referencing in process control routines", U.S. Patent 6,385,496, May 2002.
2. Brown et al., "Maintenance interface device for a use in a process control network", U.S. Patent 6,377,859, April 2002.
3. Stewart et al., "Topology analysis tool for use in analyzing a process control network design", U.S. Patent 6,411,923, June 2002.
4. Cavalieri et al., "Impact of fieldbus on communication in robotic systems", IEEE Transactions on Robotics and automation, February 1997.
5. Pyotsia et al., "Method and equipment for determining the performance of control valve", U.S. Patent 5,992,229, November 1999.
6. Larson et al., "Method and apparatus for debugging and tuning a process control network having distributed control functions", U.S. Patent 6,044,305, March 2000.

Art Unit: 2123

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7329.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
April 3, 2003



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER